INCH-POUND

MIL-PRF-15733/49J
10 April 2003
SUPERSEDING
MIL-PRF-15733/49H
4 November 1994

PERFORMANCE SPECIFICATION SHEET

FILTERS AND CAPACITORS, RADIO FREQUENCY INTEFERENCE,
HERMETICALLY SEALED, STYLE FL93

This specification sheet is approved for use by all Departments and Agencies of the Department of Defense.

Part or Identifying Numbers (PIN's) M15733/49-0002, 0003, 0004, and 0005 are inactive for new design after 6 October 1980. As of 15 March 1993, PIN M15733/49-0006 is inactive for new design. See table III for supersession data.

The complete requirements for acquiring the filters described herein shall consist of this specification sheet and the latest issue of MIL-PRF-15733.

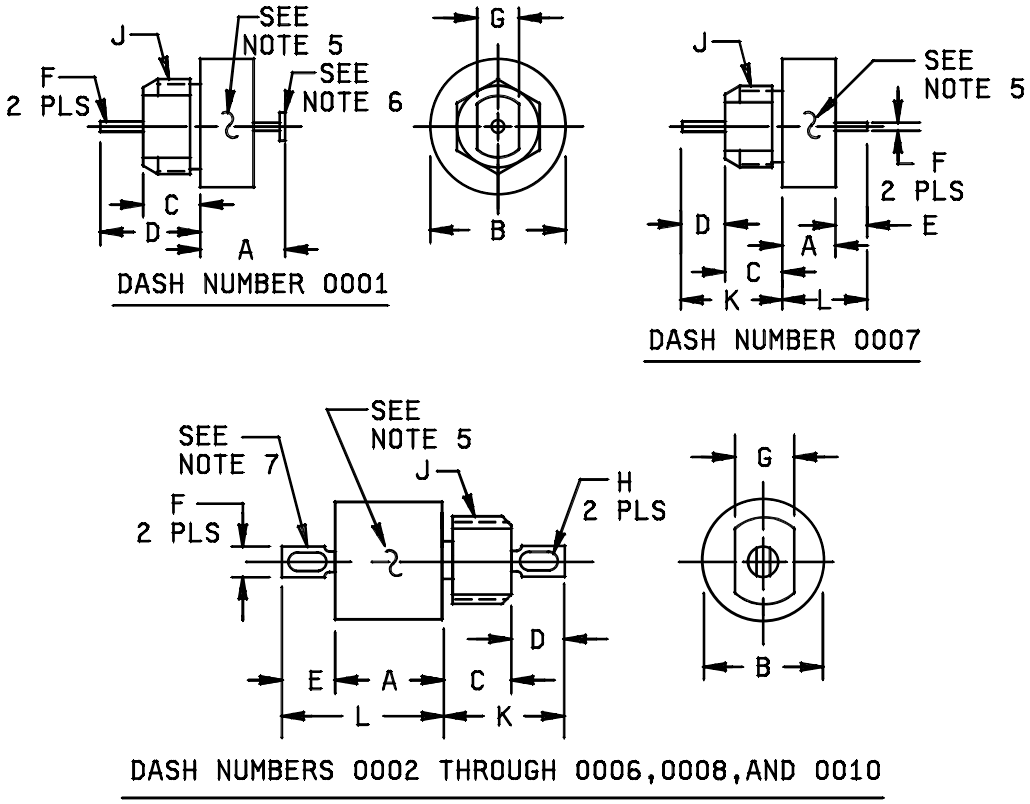
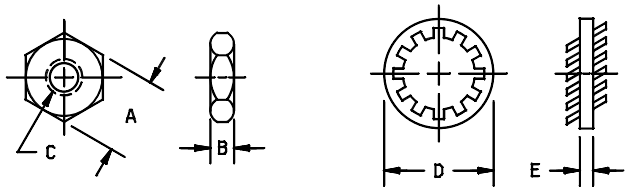


FIGURE 1. Case dimensions and circuit diagrams.

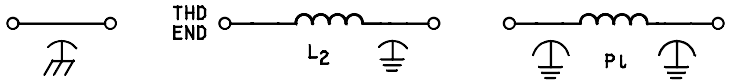
Dash no.	A		B		C		D		E		F	G		H	J	K	L
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Typ	Min	Max	Slot or hole +.010	Mounting thread	Max	Max
0001	.257 (6.53)	.319 (8.10)	----	.416 (10.57)	.177 (4.50)	.197 (5.00)	.281 (7.14)	.343 (8.71)	----	----	.040 (1.02)	.190 (4.83)	.210 (5.33)	----	.250-28 UNF-2A	----	----
0002 2/	.560 (14.22)	----	----	.385 (9.78)	.177 (4.50)	.197 (5.00)	.100 (2.54)	----	.140 (3.56)	----	.105 (2.67)	.190 (4.83)	.210 (5.33)	Slot .050 (1.27)	.250-28 UNF-2A	.387 (9.83)	.740 (18.80)
0003 2/	.160 (4.06)	----	----	.385 (9.78)	.177 (4.50)	.197 (5.00)	.140 (3.56)	----	.100 (2.54)	----	.105 (2.67)	.190 (4.83)	.210 (5.33)	.060 dia. 1/ (1.52) both ends	.250-28 UNF-2A	.357 (9.07)	.370 (9.40)
0004 2/	.160 (4.06)	----	----	.385 (9.78)	.177 (4.50)	.197 (5.00)	.140 (3.56)	----	.100 (2.54)	----	.105 (2.67)	.190 (4.83)	.210 (5.33)	.060 dia. 1/ (1.52) both ends	.250-28 UNF-2A	.357 (9.07)	.370 (9.40)
0005 2/	.210 (5.33)	----	----	.385 (9.78)	.302 (7.67)	.322 (8.18)	.140 (3.56)	----	.100 (2.54)	----	.105 (2.67)	.190 (4.83)	.210 (5.33)	.050 x .070 (1.27) x (1.78) or .070 (1.78) dia.	.250-28 UNF-2A	.482 (12.24)	.420 (10.67)
0006 2/	.160 (4.06)	----	.365 (9.27)	.385 (9.78)	.177 (4.50)	.197 (5.00)	.140 (3.56)	----	.100 (2.54)	----	.105 (2.67)	.190 (4.83)	.210 (5.33)	.050 x .070 (1.27) x (1.78) or .070 (1.78) dia.	.250-28 UNF-2A	.357 (9.07)	.370 (9.40)
0007 2/	.160 (4.06)	----	.365 (9.27)	.385 (9.78)	.177 (4.50)	.197 (5.00)	.250 (6.35)	----	.250 (6.35)	----	.040 (1.02)	.190 (4.83)	.210 (5.33)	----	.250-28 UNF-2A	.467 (11.86)	.450 (11.43)
0008	.406 (10.31)	----	----	.400 (10.16)	.180 (4.57)	.200 (5.08)	.140 (3.56)	----	.140 (3.56)	----	----	.190 (4.83)	.210 (5.33)	.050 x .070 (1.27) x (1.78) or .070 (1.78) dia.	.250-28 UNF-2A	.360 (9.14)	.576 (14.63)
0010	.500 (12.70)	----	----	.400 (10.16)	.180 (4.57)	.200 (5.08)	.140 (3.56)	----	.140 (3.56)	----	----	.190 (4.83)	.210 (5.33)	.050 x .070 (1.27) x (1.78) or .070 (1.78) dia.	.250-28 UNF-2A	.360 (9.14)	.680 (17.27)

1/ Slot optional.
2/ Inactive for new design.

FIGURE 1. Case dimensions and circuit diagrams - Continued..



HEX NUT LOCKWASHER



CIRCUIT DIAGRAMS

Filter dash no.	Hex nut					Lockwasher			
	A		B		C	D		E	
	Min	Max	Min	Max	Thread	Min	Max	Min	Max
0001	.302 (7.67)	3.22 (8.18)	.085 (2.16)	.095 (2.41)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0002	.307 (7.80)	.317 (8.05)	.088 (2.24)	.098 (2.49)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0003	.307 (7.80)	.317 (8.05)	.088 (2.24)	.098 (2.49)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0004	.307 (7.80)	.317 (8.05)	.088 (2.24)	.098 (2.49)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0005	.307 (7.80)	.317 (8.05)	.088 (2.24)	.098 (2.49)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0006	.302 (7.67)	.322 (8.18)	.085 (2.16)	.095 (2.41)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0007	.302 (7.67)	.322 (8.18)	.085 (2.16)	.095 (2.41)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0008	.307 (7.80)	.317 (8.05)	.088 (2.24)	.098 (2.49)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)
0010	----	.317 (8.05)	----	.098 (2.49)	.250-28 UNF-2B	.396 (10.06)	.408 (10.36)	.017 (0.43)	.027 (0.69)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Circuit diagrams are for information only.
4. All filters shall be supplied with mounting hardware.
5. Terminal identification. The case shall be marked at the threaded end of the filter, with the symbol “L” for dash numbers 0001, 0003, 0004, 0006, and 0007.
6. Turret head is optional.
7. Flag terminals shall be aligned within 10° of the vertical (threaded bushing flats).

FIGURE 1. Case dimensions and circuit diagrams - Continued.

TABLE I. Electrical characteristics.

Dash no.	Circuit diagram	Max rated current (amps)	Rated voltage (volts)		Max voltage drop (volts,dc)	Minimum insertion loss (dB) in accordance with MIL-STD-220 at +25°C 1/									Cap -0 +100% (µF) 8/
			DC	AC 6/		30 kHz	150 kHz	300 kHz	1 MHz	10 MHz	100 MHz	1 GHz	5 GHz	10 GHz	
0001	L_2	15	50 4/	---	.15	8	20	28	38	55	70	70	70	70	0.68
0002 2/	Pi	3	150 7/	---	.15	---	7	24	54	80	80	80	---	80	---
0003 2/	L_2	10	50 7/	---	.08	15	28	33	44	60	---	70	---	---	---
0004 2/	L_2	10	50 3/	---	.08	15	28	33	44	60	---	70	---	---	---
0005 2/	Pi	15	50 5/	---	.09	70 dB from 420 MHz to 1.0 GHz, inclusive									---
0006 2/	L_2	15	50 4/	---	.15	15	28	33	44	60	---	70	---	70	1.2
0007	L_2	15	50 4/	---	.15	15	28	33	44	60	---	70	---	70	1.2
0008	C	15	50 7/	---	.06	---	33	40	50	65	---	70	---	---	2.1
0010	C	15	330 7/	125	.06	---	6	11	21	41	---	70	---	---	0.062 8/

1/ Insertion loss measurements shall be made under full load over the frequency range of 150 kHz to 10 MHz. Insertion loss measurements above or below this frequency range shall be made under no load.
2/ Inactive for new design.
3/ Voltage rating at +125°C (Note - derated from 80 V dc at +85°) for dash number 0004.
4/ Voltage rating at +125°C (Note- derated from 100 V dc at +85°C) for dash numbers 0001, 0006, and 0007.
5/ Voltage rating at +85°C.
6/ AC voltage rating shall be dc to 400 Hz.
7/ Voltage rating at +125°C.
8/ Capacitance tolerance on -0010 is -0, +150 percent.

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Weight: 8.5 grams, maximum.

Case: Metal, silver-plated finish for -0001; metal, tin-plated or electro-tin fused except the minimum lead content shall be 3 percent (pure tin finish is prohibited. See MIL-PRF-15733.) or, tin-lead plated or hot-solder dipped (40 percent to 60 percent tin) for -0002 through -0008, and -0010.

Seal: Glass-to-metal.

Terminals: Solderable (see figure 1).

Dielectric: Ceramic.

Operating temperature range: -55°C to +125°C, except -0005 shall be -55°C to +85°C.

Rated voltage: See table I.

Rated current: See table I.

Insertion loss (at 25°C): In accordance with MIL-PRF-15733 and as specified in table I.
(at -55°C and 125°C): Insertion loss shall be as specified in table I except a degradation of 4 dB shall be allowed up to 10 MHz.

Voltage conditioning (applicable to -0001, conformance inspection only): Prior to group A inspection, 100 percent of each lot of filters shall be subjected to voltage conditioning as follows:

Test temperature: +125°C +4°C, -0°C.

Test voltage: 140 percent of the rated dc voltage.

Points of application of test voltage: Between the case and either terminal.

Duration of exposure to test voltage: 250 hours, minimum.

Measurements at +25°C after the test:

Dielectric withstanding voltage: 140 percent of rated dc voltage shall be applied for 1 minute.

Insulation resistance: Shall be not less than 500 megohms.

Insertion loss; Shall meet the initial requirements.

A reject shall be defined as a filter that fails the dielectric withstanding voltage test, insulation resistance requirements, or insertion loss. If the total rejects from any particular lot exceed 10 percent, the entire lot shall be rejected.

Radiographic inspection (applicable to -0001, conformance inspection only): Following group A inspection, 100 percent of each lot of filters shall be subjected to radiographic inspection as follows:

Filters shall be X-rayed in one plane at 90-degree rotation (perpendicular to the filter longitudinal axis). Any evidence of poor capacitor mounting or uneven soldering of capacitor to case shall be cause for rejection. Rejected units shall be dissected and examined for poor workmanship or uneven soldering. Magnification during visual examination shall be two-power minimum. Any defects noted shall require corrective action prior to acceptance of any future lots.

Seal: In accordance with MIL-PRF-15733.

Capacitance to ground: In accordance with MIL-PRF-15733 and table I.

Capacitance tolerance: +100 percent, -0 percent except -0010 shall be +150 percent, -0 percent.

Temperature rise: +25°C, maximum.

Dielectric withstanding voltage: In accordance with MIL-PRF-15733 and the following:

Test voltage: 125 percent of rated voltage (-0001); 370 V dc (-0002); 200 V dc (-0005); and 200 percent of rated voltage (-0003, -0004, -0006, -0007, -0008, and -0010) applied between terminals and case for 1 minute; polarity of the test voltage shall then be reversed and the voltage shall be applied for 1 minute.

Insulation resistance: In accordance with MIL-PRF-15733; the following details and exceptions shall apply:

Test temperature: +25°C.

Test potential: Rated dc voltage or 100 V dc whichever is less.

Insulation resistance shall be not less than:

Dash numbers	Megohms
0001	500
0002 through 0005, 0008	100
0006, 0007, and 0010	1,000

Dissipation factor (-0008 and -0010): 3 percent maximum.

Voltage drop: See table I.

Overload: In accordance with MIL-PRF-15733. The following exception shall apply:

Measurements after test: Insulation resistance (+25°) only shall be measured and shall meet initial requirements.

Terminal strength: In accordance with MIL-PRF-15733 and Method 211, MIL-STD-202; test condition A (pull):

Applied force: 5 pounds (-0001 through -0007)
4.5 pounds +3, -0 ounces (-0008 and -0010).

Thermal shock and immersion: In accordance with MIL-PRF-15733 and the following:

Measurements after final cycling shall include:

Capacitance change: Not more than ±20 percent for dash numbers -0008 and -0010.

Shock (specified pulse): In accordance with MIL-PRF-15733 and method 213 of MIL-STD-202, test condition I (-0001, -0002, -0003, -0004, -0006 through -0008, and -0010); and test condition A (-0005).

Vibration, high frequency: In accordance with MIL-PRF-15733 and Method 204, MIL-STD-202. The following details and exceptions shall apply:

Test condition: D (20 g's).

Temperature conditioning (-0002 through -0005 only): Prior to vibration in each plane, filters shall be placed in an oven and heated to +125°C plus one-half the temperature rise (-0002 through -0004) and to +85°C plus one-half the temperature rise (-0005). Vibration in each plane shall begin within 5 minutes after removal of the filters from the oven.

Moisture resistance: In accordance with MIL-PRF-15733 and the following:

Polarization voltage: 50 volts dc.

Measurements after 24-hour drying period shall be as specified in MIL-PRF-15733 and for –0008 and –0010 the capacitance shall change no more than ±20 percent from initial measured value.

Life: In accordance with MIL-PRF-15733 and Method 108, MIL-STD-202. The following details shall apply:

Test condition:

For qualification inspection: D (1,000 hours).

For group C inspection: B (250 hours) for -0001, -0003 through -0008, and -0010; D (1000 hours) for -0002.

Marking: Filters shall be marked in accordance with MIL-PRF-15733. The following details shall apply:

Minimum marking (-0001): Filters shall be marked with the PIN and terminal identification, as a minimum. The full marking specified in MIL-PRF-15733 shall be marked on the unit package.

Full marking (-0002): Filters shall be marked with the full marking specified in MIL-PRF-15733.

Minimum marking (-0003 through -0008, and -0010): Filters shall be marked with the PIN, source code, date code, and terminal identification. The full marking specified in MIL-PRF-15733 shall be marked on the unit package.

Part or Identifying Number (PIN): M15733/49-(dash number from table I).

Initial qualification to MIL-PRF-15733/49 may be granted based on qualification to MIL-PRF-28861/1 as indicated in table II. Extension of qualification from MIL-PRF-28861/1 is permissible under the following provisions:

a. The MIL-PRF-15733/49 parts use the same design and dielectric characteristics as the comparable MIL-PRF-28861/1 parts.

b. The MIL-PRF-28861/1 data verifies that the physical and electrical characteristics of the MIL-PRF-15733/49 parts are satisfied.

TABLE II. Extension of qualification.

Qualification to MIL-PRF-28861/1	Will qualify MIL-PRF-15733/49		Qualificaton to MIL-PRF-15733/49	Will qualify MIL-PRF-15733/49
-001	-0003		-0006	-0001
-001	-0004		-0006	-0007
-001	-0006		-0006	-0008
-001	-0007			
-001	-0008			
-002	-0008			

Supersession data: See table III.

TABLE III. Supersession data.

Superseded PIN (old)	Superseding PIN (new)
M83439/02-001	M15733/49-0008
M83439/02-003	M15733/49-0010
M15733/49-0002	M15733/38-0003
M15733/49-0003	M15733/49-0006
M15733/49-0004	M15733/49-0006
M15733/49-0005	M15733/38-0007
M15733/49-0006	M28861/01-001

PIN M15733/49-0009 has been deleted. For new design, use M28861/01-010 of MIL-PRF-28861/1.

Cataloging information: Dash numbers 0008 and 0010 shall be cataloged under FSC 5910 as feed-through ceramic capacitors. Dash numbers 0001 through 0007 shall be cataloged under FSC 5915 as radio frequency interference filters.

Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 59GP-0183)

Review activities:
Army - AT, AV
Navy - AS, MC, OS, SH
Air Force - 19, 99